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Chainsaw milling and Terrain of Log Conversion in Southwestern Nigeria

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Abstract

Chainsaw milling and Terrain of log conversion was examined in Southwestern Nigeria. Data for the study were obtained from chainsaw millers who were given felling permits to operate in the region. A total number of 505 logs were processed in all. Data were analysed Using Cross-tabulation and descriptive statistics. The result of this study indicated that thirty-nine (39) different tree species were processed across the selected states. One hundred and one (121) logs were processed on flat terrain while 138 and 246 logs were found processed on undulating and swampy terrains respectively. The result indicated further that 19.8% of the total logs processed on Flat terrain were *Tectona grandis* while 6.6% were *Gmelina arborea*. Furthermore, fifteen (15) species out of the thirty-nine (39) species processed in the study area are contained in IUCN (International Union of Conservation of Nature) red list and have been accessed as Vulnerable, Threatened, Lower risk, or Endangered. It is therefore imperative for Forestry authorities in the area to put effective strategies in place with regard to regulation of chainsaw milling and conservation of forest resources in order to ensure the sustainability of the resource in Southwestern Nigeria.

Keywords: Chainsaw milling, terrain, Nigeria

Introduction

Nigeria is known to cover a total land area of 923,768 km square with a population of 180 Million (1). The total land area under forest cover was estimated to be about 10Million hectares which represent 10% of the total land area (2). The forest resources of Nigeria however, are fast diminishing and presently the total land area under forest cover is estimated to be less than 6% (3). The rate of deforestation in Nigeria is known to be the highest in the world. IITA (4) and Daily Trust (5) put the rate of deforestation at about 3.27% with loss of 350,000 to 400,000 hectares of forests annually. Human activities have been identified as major cause of deforestation. These include illegal logging, road construction, agriculture expansion, expansion of cattle ranching/animal husbandry, oil and gas exploration, mining, bush burning, hunting, fishing, unsustainable and indiscriminate harvesting of non timber forest products including firewood and Infrastructure development projects. All these human activities invariably impact negatively on forest conservation in Nigeria (6).

It is worthy of note however, that loss of forest cover will definitely affect wood based industry adversely. In fact it constitutes a serious threat to the survival of the wood based industries. In recent time sawmills in Nigeria have not been able to meet production demand for wood products due to a number of factors which include frequent power outage, lack of spare parts, and ever dwindling resources (7). This has forced the local people to shift their attention to chainsaw milling as an alternative means of Sawnwood production. Products from this enterprise are cheaper and able to promptly meet the demand for Sawnwood production. Chainsaw milling now serve as an alternative means of satisfying sawn wood production demand in

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southwestern Nigeria. The unconventional method of using chainsaw for Sawnwood production on commercial scale is known as chainsaw milling. This became widespread as sawmill operations declined due to downward economic trend (8).The activities of chainsaw millers are said to be restricted to inaccessible terrains and locations that are not accessible to authourised timber trucks. Approvals and harvesting permits are issued to the operators of this enterprise by the state department of forestry only on the claims that revenue will be lost since authourised timber trucks could not access such locations, and that they are able to salvage the situation and process the logs in-situ. However, issuance of felling permits only on the claims of inaccessibility of terrain is quite unscientific and unprofessional. Inaccessibility of terrain alone could not be taken as a sufficient condition for issuance of felling permits. This study was therefore initiated to assess the terrain of log conversion in Southwestern states with the view to suggest operational guidelines under which chainsaw milling could be accommodated or practiced.

METHODOLOGY

Descriptions of the Study Area

This study was carried out in Southwestern Nigeria which consists of Lagos, Ogun, Oyo, Osun, Ondo and Ekiti states. It is also known as South West geopolitical zone of Nigeria. The area lies between longitude 2°12'E and 6°00' East and between latitude 6°21'N and 8°37'N (9) with a total land area of 78,771km^2 and a population of 108,581,994 million in 2006 with an average population density of 677.67/km^2 (10). The study area is bounded in the East by Edo and Delta States; in the North by kwara and Kogi States, in the West by the Republic of Benin and in the South by the Gulf of Guinea (Fig.1).

The climate of Southwestern Nigeria is tropical in nature and it is characterized by wet and dry seasons. The temperature ranges between 21°C and 34°C while the annual rainfall ranges between 1250mm and 3000mm. The wet season is associated with the southwest monsoon winds from the Atlantic Ocean while the dry season is associated with the north east trade winds from the Sahara desert. The vegetation of southwestern Nigeria is made of fresh water, swamp and mangrove forests and the coastal belt. The low land rain forest stretches inland to Ogun and parts of Ondo state while secondary forest is towards the northern boundary where derived and southern guinea savannah exists (11). The region which has 85 constituted forest reserves with a forest area cover of 842,499 hectare is endowed with natural forest resources, mineral deposits with extensive fertile soils (12).

Sampling Procedure

Three states namely; Ondo, Ogun and Osun were purposively selected for this study out of the six states in Southwestern Nigeria. This is because these States are known to have contiguous forests and the activities of chainsaw millers are known to be prevalent in these three states. Secondly, 40% of chainsaw millers given approval to operate on inaccessible terrains across the selected states were selected, while 505 logs were processed in all. The operational sites of these chainsaw millers were visited where each log was measured and processed. The terrain of log conversion and Sawnwood production was also observed and categorized into flat, undulating or swampy depending on the

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topography of the location. Sawnwood output from each log was also recorded.

Data Analysis

The data were analysed using cross tablelatation, frequency tables and descriptive statistics.

Table 1. Terrain of Log Conversion and Tree Species in Southwestern Nigeria

	Terrain							Total	
	FLAT		UNDULATING		SWAMPY				
Species	N	%	N	%	N	%		N	%
Lophira alata	0	0.0%	4	2.9%	34	13.8%		38	7.5%
Gmelina arborea	8	6.6%	7	5.1%	21	8.5%		36	7.1%
Albizzia zygia	5	4.1%	12	8.7%	18	7.3%		35	6.9%
Ceiba petandra	8	6.6%	10	7.2%	7	2.8%		25	5.0%
Tectona grandis	24	19.8%	0	0.0%	0	0.0%		24	4.8%
Terminalia superba	5	4.1%	6	4.3%	12	4.9%		23	4.6%
Antiaris africana	7	5.8%	8	5.8%	8	3.3%		23	4.6%
Pychnanthus angolensis	0	0.0%	3	2.2%	19	7.7%		22	4.4%
Uapaca spp	0	0.0%	3	2.2%	19	7.7%		22	4.4%
Alstonia cogensis	3	2.5%	11	8.0%	6	2.4%		20	4.0%
Triplochyton schleroxylon	3	2.5%	8	5.8%	8	3.3%		19	3.8%
Piptadeneasrtum africanum	10	8.3%	1	0.7%	8	3.3%		19	3.8%
Milicia excelsa	4	3.3%	7	5.1%	6	2.4%		17	3.4%
Riccinodendron heudelotti	0	0.0%	5	3.6%	11	4.5%		16	3.2%
Celtis spp	4	3.3%	3	2.2%	8	3.3%		15	3.0%
Bombax spp	7	5.8%	5	3.6%	2	0.8%		14	2.8%
Malachantha alnifolia	4	3.3%	6	4.3%	3	1.2%		13	2.6%
Daniellia ogea	3	2.5%	1	0.7%	8	3.3%		12	2.4%
Cola gigantia	7	5.8%	3	2.2%	1	0.4%		11	2.2%
Cleistopholis patens	3	2.5%	2	1.4%	5	2.0%		10	2.0%
Brachystegia spp	2	1.7%	5	3.6%	3	1.2%		10	2.0%
Hellia ciliata	3	2.5%	2	1.4%	5	2.0%		10	2.0%
Cordia millenii	0	0.0%	3	2.2%	6	2.4%		9	1.8%
Irvingia garbonensis	0	0.0%	2	1.4%	5	2.0%		7	1.4%
Musanga cecropoides	0	0.0%	0	0.0%	7	2.8%		7	1.4%
Berlinia spp	2	1.7%	4	2.9%	0	0.0%		6	1.2%
Afzellia spp	1	0.8%	2	1.4%	3	1.2%		6	1.2%
Pterygota spp	2	1.7%	1	0.7%	2	0.8%		5	1.0%
Symphonia globulifera	0	0.0%	0	0.0%	4	1.6%		4	0.8%
Vitex doniana	0	0.0%	0	0.0%	3	1.2%		3	0.6%
Diospyros spp	0	0.0%	3	2.2%	0	0.0%		3	0.6%
Lannea welwitschii	3	2.5%	0	0.0%	0	0.0%		3	0.6%
Steculia rhinopetala	0	0.0%	3	2.2%	0	0.0%		3	0.6%
Steculia oblonga	1	0.8%	0	0.0%	2	0.8%		3	0.6%
Lovoa trichyloides	0	0.0%	3	2.2%	0	0.0%		3	0.6%
Khaya ivorensis	0	0.0%	3	2.2%	0	0.0%		3	0.6%
Erythrophyllum ivorense	0	0.0%	2	1.4%	0	0.0%		2	0.4%
Pterocarpus angolensis	2	1.7%	0	0.0%	0	0.0%		2	0.4%
Poga oleosa	0	0.0%	0	0.0%	2	0.8%		2	0.4%
Total	121	100.0%	138	100.0%	246	100.0%		505	100.0%

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Table 2. Table of Tree Species and IUCN Status

	TREE SPECIES	COMMON/LOCAL NAMES	IUCN STATUS*
1	*Lophira alata*	Eki	Vulnerable
2	*Gmelina arborea*	Melina	Not yet Assessed
3	*Albizzia zygia*	Ayinre	Not yet Assessed
4	*Ceiba pentandra*	Araba	Least Concern
5	*Tectona grandis*	Teak	Not yet Assessed
6	*Terminalia superba*	White afara	Not yet Assessed
7	*Antiaris africana*	Oro	Not yet Assessed
8	*Pycnanthus angolensis*	Akomu	Not yet Assessed
9	*Uacapa spp*	Akun	Not yet Assessed
10	*Alstonia congensis*	Awun	Not yet Assessed
11	*Triplochyton scleroxylon*	Arere	Lower Risk
12	*Piptadeneastrum africanum*	Agboin	Not yet Assessed
13	*Milicia excelsa*	Iroko	Lower Risk/Near threatened
14	*Ricinodendron heudelotii*	Potopoto	Not yet Assessed
15	*Celtis integrifolia*	Itara	Not yet Assessed
16	*Bombax spp*	Ponpola	Not yet Assessed
17	*Malacantha alnifolia*	Akala	Not yet Assessed
18	*Daniellia ogea*	Iya	Not yet Assessed
19	*Cola gigantea*	Oporoporo	Not yet Assessed
20	*Cleistopholis patens*	Apako	Not yet Assessed
21	*Brachystegia nigerica*	Eku	Vulnerable
22	*Hellia ciliata*	Abura	Not yet Assessed
23	*Cordia millenii*	Omo	Lower Risk/Least Concern
24	*Irvingia gabonensis*	Oro	Lower Risk/Near threatened
25	*Musanga cecropoides*	Aga	Not yet Assessed
26	*Berlinia coriacea*	Apado	Least Concern/Decreasing
27	*Afzelia africana*	Apa	Vulnerable

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28	*Pterygota spp*	Oporoporo*	Vulnerable
29	*Symphonia globulifera*	Hog gum tree	Not yet Assessed
30	*Vitex doniana*	Black Plum	Least Concern
31	*Diospyros spp*	Osun	Endangered
32	*Lannear welwitschii*	Ekika-aja	Not yet Assessed
33	*Sterculia rhinopetala*	Red Sterculia	Not yet Assessed
34	*Sterculia oblonga*	Yellow Sterculia	Vulnerable
35	*Lovoa trichiloides*	African Walnut	Vulnerable
36	*Khaya ivorensis*	African Mahogany	Vulnerable
37	*Erythrophyleum ivorense*	Sasswood	Not yet Assessed
38	*Pterocarpus angolensis*	Bleedwood Tree	Lower Risk/Near threatened
39	*Poga oleosa*	Afrinan-Brazil nut	Not yet Assessed

*IUCN Red list of threatened Species, Version 2017-3

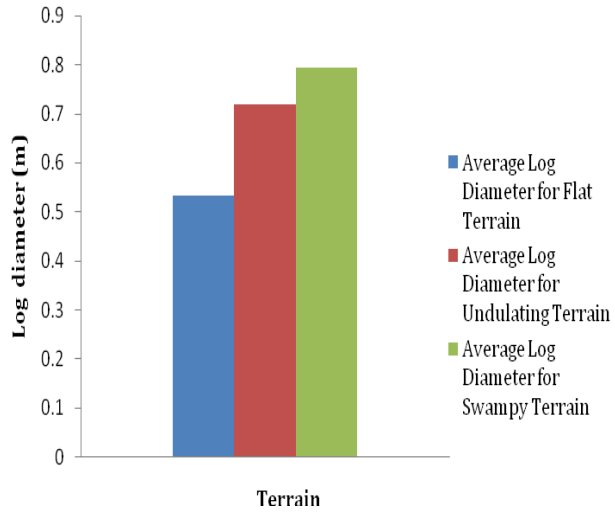

Fig. 2: Chart indicating the relationship between Log diameter and Terrain of conversion.

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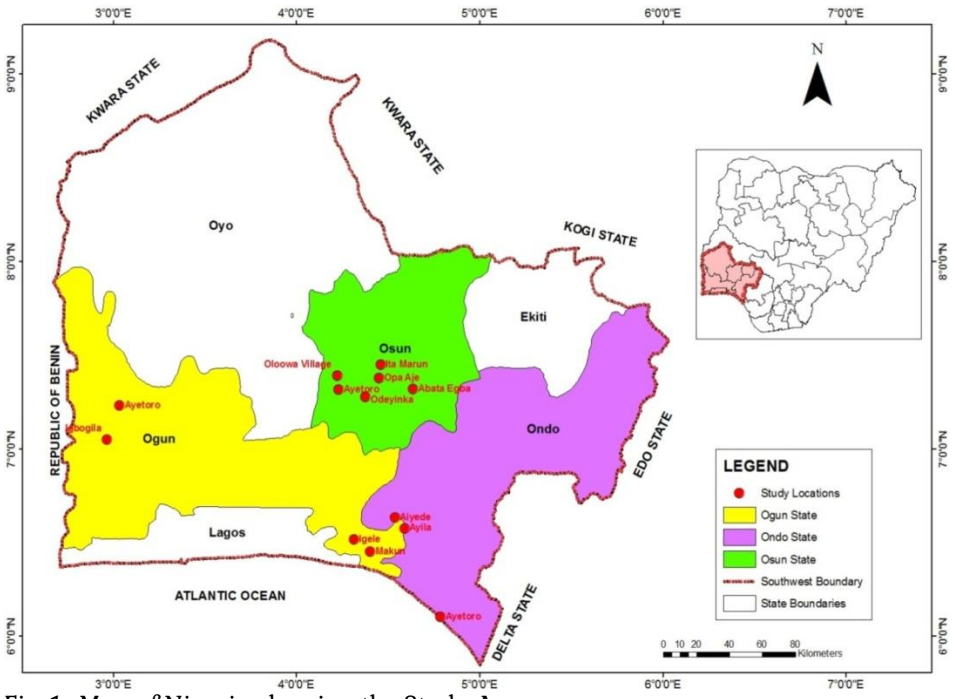

Fig. 1: Map of Nigeria showing the Study Area.

RESULTS AND DISCUSSION

The result of this study indicated that thirty-nine (39) different tree species were processed across the selected states. Trees were processed on both accessible and inaccessible terrains. One hundred and one (121) logs were processed on flat terrain while 138 and 246 logs were found processed on undulating and swampy terrains respectively (Table 1). Although approval for felling permits were issued to chainsaw millers on the basis of inaccessibility of terrain some of them still found their ways into locations that are accessible to timber trucks. The result indicated further that 19.8% of the total logs processed on Flat terrain were *Tectona grandis* while 6.6% was *Gmelina arborea*. This implied that logs processed on accessible terrains are illegally carried out since approval was not given for accessible terrain. The presence of *Tectona grandis* and *Gmelina arborea* in the list of trees processed in the study area could further suggest that Chainsaw milling activities have extended beyond natural forest into plantation forests in southwestern Nigeria. This however, could mean that the forest authorities in Southwestern Nigeria did not have capacity to monitor activities of chainsaw millers or that they are not been monitored at all.

Furthermore, fifteen species (15) out of the thirty-nine (39) species processed in the study area are contained in IUCN red list and have been accessed as Vulnerable, Threatened, Lower risk, or Endangered (Table 2). Such species include *Lophira alata, Triplochyton schleroxylon, Cordia millenii, Afzelia Africana, Brachystegia spp, Irvingia gabonensis, Steculia oblonga* e.t.c. These species of trees having been stated in IUCN red list ought not to be processed nor felled. This further suggests that species conservation was not

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taken into consideration when felling approval was issued. It appeared that the argument of chainsaw millers that they are able to access the inaccessible terrains to generate more revenue are given priority over conservation of genetic resources. However, if the activities of chainsaw millers should continue unchecked as been currently practiced, it means in the near future such species will become extinct in the Southwestern Nigeria. In addition, streams will dried up and flooding will become regular occurrence since trees which provide cover are been removed unabated. These inaccessible terrains are ecologically sensitive locations where otherwise should be protected and felling of trees in such terrain should not have been allowed.

The result of this study indicated further that mean log diameter (m) for logs processed on flat terrain was 0.53 while 0.72 and 0.79 were recorded for logs processed on undulating and swampy terrains respectively (Fig.2). This suggests that continuous and uncontrolled exploitation pressure have reduced the availability of mature and large diameter logs on flat terrains. Large diameter logs only exist on inaccessible terrains and the attention of the practitioners of chainsaw milling is majorly on the ecologically sensitive terrains where trees should not have been felled. As observed by Isikuhemen (13), it is no longer feasible to carry out commercial logging because of high percentage of immature and juvenile trees; this is because the resources have been depleted beyond the limits of the ecosystem. Thus, mature trees have become increasingly scarce.

In conclusion, the practitioners of chainsaw milling in the study area do not take the principles of conservation and ecology into consideration in performance of their activities. This however, does not potent a good future for forestry practice in the area. Therefore, strategies should be put in place in order to effectively regulate and control the activities of chainsaw millers and to include conservation and ecological considerations in the stipulated conditions for issuance of felling permits by forestry authorities in southwestern Nigeria.

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